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17th Part of Report No. AARE/931



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AEROPLANE AND ARMAMENT EXPERIMENTAL ESTABLISHMENT

BOSCOMBE DOWN

WESSEX HELICOPTER

CLEARANCE FOR CARRIAGE AND RELEASE, INTERNALLY AND
EXTERNALLY, OF THE PRACTICE DEPTH CHARGE MK.15 MOD.12

[U]

PRESENTED BY

FLIGHT LIEUTENANT R. ASHCROFT
ARMAMENT DIVISION.

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17th Part of Report No. AAEE/931

25 MAR 1963

AEROPLANE AND ARMAMENT EXPERIMENTAL ESTABLISHMENT
BOSCOMBE DOWN

Wessex Helicopter

Clearance for Carriage and Release, Internally and
Externally, of the Practice Depth Charge Mk.15 Mod.12

Presented by

Flight Lieutenant R. Ashcroft
Armament Division.

A. & A.E.E. Ref: Arm. X.2
M.O.A. Ref: AV/591/01
Period of Trial: 9th July, 1962 - 26th July, 1962.

Summary


This Report deals with the trial carried out to clear the Wessex helicopter for the carriage and release, internally and externally, of the Practice Depth Charge Mk. 15 Mod. 12. It also deals with the suitability of the store for Service use.

It is recommended that the practice Depth Charge Mk. 15 Mod. 12 is suitable for Service use and that it be cleared for carriage and release, internally and externally, from all Marks of Wessex helicopter within the following limitations:-

<u>Carriage</u>	Up to the maximum height, speed and manoeuvre limitations of the helicopter.
<u>Release</u>	Heights from 25 ft to 500 ft, speeds from the hover to aircraft maximum.

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1. Introduction

Trials to clear the carriage and release of Practice Depth Charges Mk.15 Mod.12, both internally and externally, on the Wessex helicopter have been completed. Ministry of Aviation Trials Proforma Authority H.19, reference AV/591/01 dated 28th February 1962, refers

2. Object of the Trial

The object of the trial was to determine the suitability of the Practice Depth Charge Mk.15 Mod.12 for Service use, and to clear the Wessex helicopter for the carriage and release of the Practice Depth Charge from the cabin Flare chute and doorway, and from Light Series Bomb Carriers.

3. Description of the Installation

The bombing installation used on the Wessex helicopter comprised:-

- (a) Two Special Store Carriers as described in A.P.(N)1023(11), Sect. C, Chap. 3 (Introduced by Wessex Mod. 5002).
- (b) Two Light Series Bomb Carriers Mk.12 (Stores Ref. 11A/3531) and Mk.3 Adaptors (Stores Ref. 11A/2784) as described in A.P.1664A, Vol. 1.
- (c) Four locally manufactured sole plates fitted to each Light Series Bomb Carrier. (See Fig. 1). These were manufactured from 20 s.w.g. Stainless Steel to the dimensions given in Appendix 'I'.
- (d) The Armament Control Panel as described in A.P. 4723A, Book 2, Sect. 5, Chap. 1, Group G.1.

4. Method of Trial

4.1 Ground Examination

The ground examination consisted of:-

- (a) Visual examination of the installations and functional testing of the release and jettison systems.
- (b) Fitting of the sole plates to the Light Series Bomb Carriers and fitting a split ring over each rear crutch stem.
- (c) Final preparation and loading of the stores.

4.2 Flight Tests

Due to the restriction of flying hours on Wessex helicopters it was necessary to combine Carriage Flights with Release Flights. Four Practice Depth Charges were carried on the Port and Starboard carriers and four stores were carried internally in the rear cabin. A submarine was made available for the trial by the Senior Naval Officer, Northern Ireland, to report on the audibility of the stores. The submarine cruised at periscope depth during the release of the stores as shown in Appendix 'II' (9.7.62). Range distances from the submarine were calculated by Dead Reckoning. Attacks over the submarine were made from astern, ahead, port and starboard. Releases of the stores from the Light Series Bomb Carriers were carried out from Port to Starboard, thus permitting the pilot to compare the helicopter handling from both symmetric and asymmetric aspects. Further releases were made through the cabin Flare chute and open doorway. The remaining releases shown in Appendix 'II', dated 17th, 18th and 26th July, 1962 respectively, were carried out during exercises with the Anti-Submarine School.

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5. Results of the Trial

5.1 Ground Examination

(a) A visual examination of the installation and functional checks of the release and jettison systems revealed no defects.

(b) Trial fitment of the sole plates to the Light Series Bomb Carriers revealed the necessity to increase the width of the centre slot in the sole plates. These were then secured in position by soft iron lock wire passed through the holes in the sole plates and round the crutch pads. The ends of the soft iron lock wire were twisted together in accordance with standard engineering practice.

(c) The Practice Depth Charges were received in a fully assembled condition. They were prepared for carrier suspension by attaching No. 35 Suspension Lugs, by means of No. 3 Jubilee Clips. The lugs were attached at the horizontal C.G. of the stores. As no safety arrangements were embodied in the Practice Depth Charges to prevent functioning when loaded on to a ditched helicopter, or when jettisoned with the Light Series Bomb Carriers, it was decided to introduce No. 8 Arming Wires to replace the hydrostatic bellows safety pins. The No. 8 Arming Wires were passed from rear to front through the safety pin hole of the hydrostatic bellows, and secured by one Safety Clip. To ensure a clean withdrawal of the Arming Wires it was necessary to position the No. 35 Suspension Lugs, on the stores, 90° radially to the hydrostatic bellows. A Fuze Setting Control Link (Stores Ref. 11A/3661) was secured to each split ring fitted over each rear crutch stem. The stores were loaded on to the Light Series Bomb Carriers in the normal manner and crutched in position horizontal to the ground by the sole plates bearing on the full length of the stores. (See Fig. 1). The Fuze Setting Control Links were then attached to the loops of the No. 8 Arming Wires. No difficulty was experienced in carrying out any of the above operations.

5.2 Flight Tests

Carriage and Release Flights

All stores released cleanly with a satisfactory separation from the Light Series Bomb Carriers and the helicopter. The Fuze Setting Control Links withdrew the No. 8 Arming Wires from the hydrostatic bellows satisfactorily. Six stores were released through the helicopter Flare Chute, and six through the open cabin doorway. The hydrostatic bellows safety pins of these stores were withdrawn by hand prior to releasing the stores. All stores used during the trial had a depth setting of 50 ft. This was decided in order to comply with Admiralty Publication U.S.M./66/61 A.L. M11 dated 7.2.62. All stores functioned satisfactorily on entering the water. A report by the Commanding Officer of the submarine on the efficiency of the stores is attached at Appendix 'III'. The pilot reported that there was no apparent difference in handling the helicopter, in either symmetric or asymmetric condition, from that of a 'clean' helicopter.

It was observed, during the trial, that with the starboard Special Store Carrier fitted, difficulty would be experienced in hoisting an injured or unconscious survivor on the rescue hoist, since the direct line of lift is obstructed by the Special Store Carrier. This Carrier cannot be jettisoned.

6. Conclusions

From the results of the trial it is concluded that:-

(a) The Practice Depth Charge Mk. 15 Mod. 12 is suitable for Service use, when carried on externally fitted Light Series Bomb Carriers, or released through the cabin Flare Chute or open doorway of the Wessex helicopter.

/(b) ...

(b) Sole Plates must be fitted to the Light Series Bomb Carriers to enable the stores to be securely crutched. The fore and aft position of the lug is such that the normal method of crutching stores is impractical, as the body of the store is too far forward when the store is loaded on to the carrier.

(c) Fuze Setting Control Links (Stores Ref. 11A/3661) are of a suitable length to withdraw the No. 8 Arming Wires successfully under all conditions of airspeed.

(d) The suspension lug must be positioned 90° radially to the hydrostatic bellows of the store.

(e) An analogous clearance can be given for carriage and release of the Practice Depth Charge Mk. 15 Mod. 12 from all Marks of Wessex helicopters.

7. Recommendations

It is recommended that the Practice Depth Charge Mk. 15 Mod. 12 is suitable for Service use and that all marks of Wessex helicopters be cleared for its carriage and release, internally and externally, within the following limitations:-

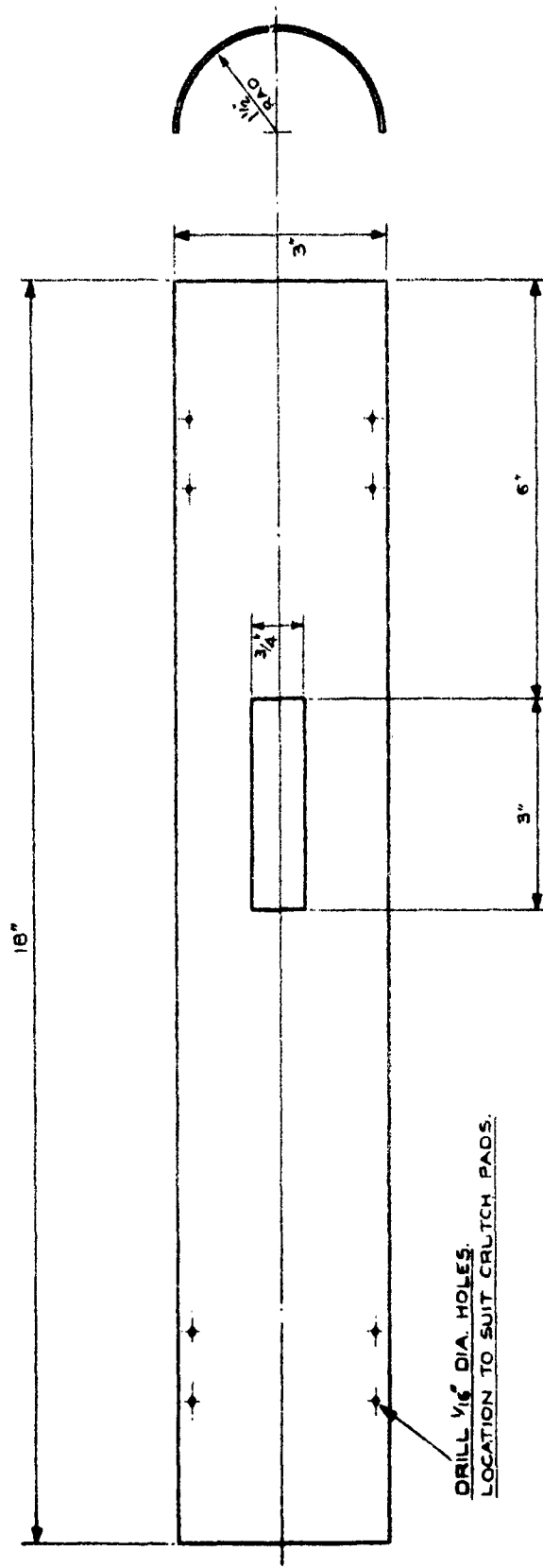
Carriage Up to the maximum height, speed and manoeuvre limitations of the helicopters.

Release Heights 25 ft to 500 ft, at speeds from hover to maximum.

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DRILL $\frac{1}{16}$ " DIA. HOLES.
LOCATION TO SUIT CLUTCH PADS.

SOLE PLATE FOR L.S.B.C.
(FOR USE WITH MK. 15. (MOD. 12) P.D.C.)

MATERIAL: 20 SWG. S. STEEL.

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Appendix II

Sortie Record - Release Flights

Date	Run No.	Height (Ft)	I.A.S. (Kts)	L.S.B.C./ Hand Launch	Estimated Range from Submarine (Yds)	Remarks
9.7.62	1	50	60	Port L.S.B.C.	6000	Satisfactory
	2	50	60	" "	6000	"
	3	100	80	" "	6000	"
	4	100	80	" "	6000	"
	5	500	120	Stbd. "	5000	"
	6	500	40	" "	5000	"
	7	300	20	" "	4000	"
	8	300	20	" "	4000	"
	9	150	80	Flare Chute	2500	"
	10	150	80	" "	2500	"
	11	50	20	Cabin Doorway	1000	"
	12	50	120	" "	1000	"
17.7.62	13	100	0	Flare Chute	500	Satisfactory
	14	50	20	Port L.S.B.C.	500	"
	15	200	60	" "	3000	"
	16	125	80	Cabin Doorway	1500	"
	17	125	100	Flare Chute	1000	"
	18	125	80	" "	1500	"
18.7.62	19	25	10	Port L.S.B.C.	2000	Satisfactory
	20	250	100	" "	3000	"
	21	100	20	Cabin Doorway	2000	"
26.7.62	22	100	120	Flare Chute	3000	Satisfactory
	23	300	100	Cabin Doorway	3000	"
	24	30	40	" "	1000	"

All stores reported heard loud and clear by submarines, aurally, sonar and U.W.T. There were no hang-ups or failures.

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Appendix III

Trial Report by Commanding Officer H.M.S. Token

Time of H/C Dept.	Run No.	Range of Drop (Yds)	Explosion Heard*			Time	Remarks
			UWT	Sonar	Aural		
1345-A	1	5,500 plus	L	L	-	13.49-	H/C passed over. Approx. 5,500 yds.
1352-A	2	5,500-6,000	L	L	L	13.56	H/C passed over. Lost radar 4,000 yds.
1358-A	3	6,000	L	L	L	14.01	H/C flying out 080°. About 6,000 yds. Not on radar.
1403-A	4	6,000	L	L	L	14.06	H/C flying out North. Not on radar.
1409-A	5	4,000	L	L	L	14.11	H/C opening to West. Not on radar.
1413-A	6	5,500	L	L	L	14.16	H/C opening out 268°, approx 6,000 yds, lost radar contact 4,200 yds.
1422-A	7	5,000	L	L	L	14.25	H/C opening out 080°. Lost radar contact 4,200 yds.
1426-A	8	4,200	L	L	L	14.29	H/C opening out 080°. Lost radar contact 4,200 yds.
1431-A	9	3,500	L	L	L	14.32	H/C opening out 342°. Lost radar contact 3,000 yds.
1434-A	10	3,000	L	L	L	14.35	H/C opening out 340°. Lost radar contact 1,000 yds.
1436-A	11	2,000	L	L	L	14.37	H/C opening out 080°. Very loud.
1438-A	12	1,000	L	L	L	14.38	H/C opening out 170°. Very loud.

*L = Loud. W = Weak

All charges heard distinctly on U.W.T., Sonar and Aurally from
fore-ends, even when dropped astern of me at 6,000 yds. Last
two explosions were very loud.

(SGD) A.F. HOSIE,
Lt.Cdr. R.N.
H.M.S. Token.

FIGS. 1, AND 2.

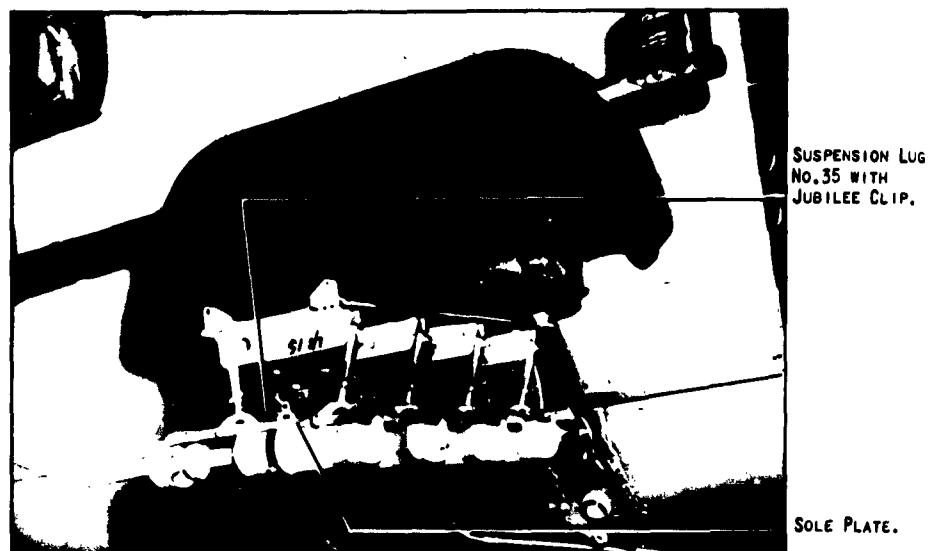


FIG. 1. PRACTICE DEPTH CHARGES LOADED ON L.S.B.C. FITTED TO Mk.3 ADAPTOR.



FIG. 2. PRACTICE DEPTH CHARGES LOADED ON L.S.B.C. - REAR VIEW.



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